

Daughter's day

Girls see the workplace first hand when JSC employees participate in a pathfinding program. Story on Page 3.



Name game

TDRSS tracking stations at White Sands are given Indian names by New Mexico students. Story on Page 4.

Space News Roundup

Vol. 32

May 24, 1993

No. 20

Endeavour nears fourth launch as preparations enter final stretch

By James Hartsfield

With STS-57 launch preparations for *Endeavour* entering the final stretch, shuttle managers were set to meet Friday for a final review of the activities, following which an official launch date, perhaps as early as June 3, may be announced.

Preparations of *Endeavour* at KSC's Launch Pad 39B have gone smoothly, however, an investigation is continuing into a loud noise heard at the pad on April 29. The noise heard by technicians was reported as unusual and loud in the engine compartment. It also was noticed by workers in the shuttle's crew cabin.

At the time of the noise, a parts of the main engine plumbing were being pressurized with helium for a leak check. A series of inspections of various components of the shuttle followed during the next weeks, including checks of the connecting struts and bolts for the external tank and solid rockets, structural inspections of the orbiter and checks of the landing gear, among others. As part of the inspections, engineers found small scratches on a ball that is part of a joint in the 17-inch diameter fuel line. The joint is one of three that allow the line, which feeds hydrogen from the external tank to *Endeavour*,

to flex during flight.

Shuttle engineers believe the noise may have been caused by the ball in the joint being stuck in place and popping loose as the fuel line was pressurized with helium for the leak check. An analysis to determine if such an occurrence could have caused the noise and if the joint is now operating normally is not expected to be completed until Tuesday.

However, preliminary indications have made managers optimistic that the noise was caused by the joint and that it will not pose a problem for the STS-57 launch.

Meanwhile, at the pad last week, technicians began fueling *Endeavour's* orbital propulsion systems with hypergolic fuel. They also began installing heat shields around the main engines, checked the auxiliary power units that power the hydraulics onboard for leaks and closed the payload bay doors for flight.

Elsewhere, in the Bay 3 processing hangar, work readying *Discovery* for shuttle mission STS-51, scheduled for mid-July, proceeded smoothly as well. This week, connections were tested between the Orbiting Far and Extreme Ultra-

violet Spectrometer and the Shuttle Pallet Satellite that will carry the astronomy instrument as it flies free from *Discovery*. Checks also were performed on the connections between the Advanced Communications Technology Satellite and the Transfer Orbit Stage that will propel the satellite to its final orbit once it is deployed from *Discovery*.

In addition, technicians checked *Discovery's* flight controls, installed the forward reaction control system steering jets module, tested the mechanical arm, electrical generation system, orbital maneuvering system, waste system and auxiliary power units.

Columbia, fresh from space, is back at KSC after a ferry flight from Edwards Air Force Base, Calif., atop the Boeing 747 Shuttle Carrier Aircraft. Work on the oldest shuttle last week included opening the payload bay doors, removing the ferry flight equipment and powering up the spacecraft. The Spacelab D-2 module was scheduled to be removed from the cargo bay late last week.

Columbia's next mission will be Space and Life Sciences-2, the second shuttle flight dedicated to studying human physiology in space.



NASA Photo

STS-57 Payload Commander David Low checks in on Mission Specialist Janice Voss as she checks out the Spacehab module at the Kennedy Space Center before vehicle integration.

Crews look at missions past and yet to come

STS-55 gives Germans taste of space

By Barbara Schwartz

Being a Jack-of-all-trades, working hectic 12-hour shifts around-the-clock, and acting as human test subjects constituted only a part of the duties performed by STS-55 crew members during their 10-day German Spacelab mission.

Commander Steve Nagel, Pilot Tom Henricks, Payload Commander Jerry Ross, Mission Specialists Charlie Precourt and Bernard Harris, and Payload Specialists Ulrich Walter and Hans Schlegel described their mission during a press conference Wednesday.

Of the 88 experiments onboard, 40 percent dealt with investigations into human physiology. Harris compared the Anthrorack unit in the Spacelab to a small emergency room here on Earth, having the "abilities to do pulmonary function tests, do exercise stress tests, spinning down our specimens (and storing them) for analyses here on the ground."

Harris said that actually experiencing his own physiological adaptation to space gave him new insight into the process for future

investigations.

"It is important for us to not only study how operationally we do in space but it is important for us to figure out the timeline for each of these conditions," he said. "The only way we can do that is to do human research, to expose people to microgravity and to see what happens."

Harris said that what we learn from these studies will aid in developing counter-measures to help future crew members to maintain proficiency on orbit and to more easily readapt to a gravity environment when they return home.

The German payload specialists agreed with Harris that there is nothing comparable to first-hand experience in microgravity. Walter said that parabolic flights and reading about spaceflight did not provide a true perspective of the real thing.

Also during their mission, astronauts used seven types of furnaces in the orbiting laboratory to melt three dozen different samples of various compositions. The crew was able to

Please see STS-55, Page 4



STS-57 to include variety of activities

By Kari Fluegel

If variety is the spice of life, then the STS-57 crew members will have a shuttle load of spice when *Endeavour* launches next month.

"We find STS-57 to be quite a special flight not only from a personal standpoint but from the standpoint that this flight has aspects of everything that has ever flown in space related to it," Commander Ron Grabe said this week during a pre-flight press conference.

Grabe will be joined on the flight by Pilot Brian Duffy, Payload Commander David Low, and Mission Specialists Nancy Sherlock, Jeff Wisoff and Janice Voss.

The highly integrated flight plan will allow astronauts to perform a rendezvous, retrieve a satellite, perform on-board science as in a laboratory mission and participate in a spacewalk.

"The diverse nature of the flight is what is offering the greatest reward and the greatest challenge," Grabe said.

Specifically, crew members will rendezvous with and retrieve the European Retrievable

Carrier which was deployed last summer on STS-46. The platform has been orbiting the Earth with a variety of materials science, life science and technology experiments.

The crew also will perform 22 different experiments in the new Spacehab middeck augmentation module flying for the first time on STS-57.

"Spacehab is the first commercial module to fly on board the space shuttle for the purpose of studying scientific experiments in the unique microgravity environment the space shuttle provides," Low said.

The Spacehab complement includes 13 experiments from NASA's Centers for the Commercial Development of Space and look at life sciences, materials sciences and crystal growth, Voss said.

"It's an extension of what we've got in the middeck," Low said. "It allows a lot more volume to bring experiments along and conduct those experiments."

Low and Wisoff also will participate in a four-hour extravehicular activity to test various

Please see STS-57, Page 4



NASA joins forces with industry to increase understanding of AIDS

NASA and American Bio-Technologies Inc. of Cambridge, Mass., have teamed together in an attempt to contribute to a better understanding of a world public health problem—Acquired Immune Deficiency Syndrome.

Under an agreement signed April 26, each organization will bring its own unique capabilities to a comprehensive research effort.

"This endeavor represents a massive and unprecedented approach to structure-oriented AIDS research," said Simon McKenzie, American Bio-Technologies president.

The goal is to use advanced x-ray crystallography technology and expertise developed by the Marshall Space Flight Center to advance fundamental knowledge of Human

Immunodeficiency Virus and AIDS, to develop new and promising therapeutic approaches for HIV and AIDS, and to develop superior biological materials for vaccine development and HIV detection.

The structural biology research group at Marshall will bring new emerging technology in high-brilliance x-ray generators, access to the microgravity environment aboard the space shuttle and novel crystallization approaches to bear on the research effort.

American Bio-Technologies, the major world supplier of synthetic HIV proteins, will provide researchers at Marshall with all proteins of HIV-1 and related retroviruses.

"Normally, a research group is considered very fortunate to have

access to a single protein from HIV-1 for crystallographic purposes," said Dr. Daniel Carter, chief of the Biophysics Branch of Marshall's Space Science Laboratory. "We will have access to quantities of all of them."

"We will use our unique capabilities to grow crystals of the proteins and then use our analytical and computer-based technologies to attempt to determine the accurate three-dimensional structures of the biological molecules. Our group previously determined the first structure of a human antibody which recognizes the AIDS virus, published in the Proceedings of the National Academy of Sciences last summer."

Knowledge of the structures of

molecules provides critical insights into molecular function. Such insights can speed the design of vaccines, pharmaceuticals or inhibitory agents to prevent or cure diseases, according to the National Institutes of Health. The organization believes that structural biology is the linchpin in U.S. biotechnology research.

"Critical to the success of such endeavors is the production of relatively large, high-quality single crystals of the proteins of interest," Carter said. "Consequently, large and expensive quantities of recombinant protein are required for each targeted structure. American Bio-Technologies is uniquely positioned to support this strategy."

American Bio-Technologies and NASA research groups are pursuing

what is one of the greatest research problems of our time with a true sense of urgency and great purpose, Carter added.

"Today, only two structures of the approximately 20 proteins of HIV-1 have been determined and none from the related viruses HIV-2, HTLV-1, HTLV-II and SIV, have been determined," McKenzie said.

If successful, determination of the atomic structures of HIV and HIV-related retroviruses could provide key insights into the critical function of many of the virus components essential to the development of new vaccines, therapies and diagnostics.

Both NASA and American Bio-Technologies intend to publish the results of their efforts under this agreement.

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m.-2 p.m. weekdays. For more information, call x35350 or x30990.

Splash Town USA — Discount tickets: \$10.50.

Astroworld Early Bird Special — Tickets purchased before May 31 and used before June 30 at \$15.95.

Sea World in San Antonio — Discount tickets: adult, \$19.75; child (3-11), \$13.15.

Fiesta Texas, San Antonio — Discount tickets: adult, \$18.35; child (4-11) \$12.75.

Space Center Houston — Discount tickets: adult, \$7.50; child (3-11) \$4.50; commemorative: \$8.75.

Metro tickets — Passes, books and single tickets available.

Movie discounts — General Cinema, \$4.50; AMC Theater, \$3.75; Loews Theater, \$4.

JSC

Gilruth Center News

Sign up policy — All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a badge or EAA membership card. Classes tend to fill up four weeks in advance. For more information, call x30304.

EAA badges — Dependents and spouses may apply for photo identification badges from 6:30-9 p.m. Monday through Friday. Dependents must be between 16 and 23 years old.

Defensive driving — Course is offered from 8 a.m.-4:30 p.m. June 12. Cost is \$19.

Weight Safety — Required course for employees wishing to use the Gilruth weight room is offered from 8-9:30 p.m. June 2. Pre-registration is required; cost is \$5.

Aerobics — High/low-impact classes meet from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32 for eight weeks.

Exercise — Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is \$24 for eight weeks.

Aikido — Martial arts class meets Tuesdays from 6:15-8 p.m. Cost is \$15 per month.

Scuba — Classes meet Tuesdays and Thursdays for four weeks beginning June 17. Cost is \$190, with a \$50 deposit required at registration.

Tennis Lessons — Lessons for beginners start May 24 and for intermediate players May 26. Classes will meet from 5:15 to 6:45 p.m., and cost is \$32 per person.

Fitness program — Health Related Fitness Program includes medical examination screening, 12-week individually prescribed exercise program. Call Larry Weir, x30301.

JSC

Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Ads may be run only once. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2. No phone or fax ads accepted.

Property

Rent: University Trace condo, 1 BR, study, 1-1/3 baths, W/D opt, sec alarm, cov parking, brwn carpet, new paint, avail 5-24, \$495/mo. x48621 or 480-2417.

Sale: LaGrange, TX, 2-1 cottage on 5 wooded acres + extras, \$35k. Jennifer, x38668 or 286-0507.

Rent: Sagemont 4-2-2, 1.5 stories, recently completely rebuilt, \$675/mo. Minh, 333-6806 or 484-2456.

Sale: Dickinson Bayou waterfront, 4-2-5-2, 100 yr old trees, pool, wet bar, FB, volleyball and horseshoe set up, alarm, sec lighting, fenced, 3/4 acre, \$224k. x34353 or 337-1640.

Sale: Friendswood/Wedgewood 3-2-5-2, lg LR, patio, trees, fenced, quiet neighborhood, high 60s. 482-6609.

Lease: Pipers Meadow/CLC 3-2-2, DR, FPL, gas util, fenced, patio, no pets, \$825/mo. 482-6609.

Sale: Houston County, 20 acres, cabin, spring fed stream, \$15k marketable timber, \$45k owner financed. (409) 687-4663.

Sale: Meadow Bend 3-2-2, 1550 sq ft. lg kitchen and LR, storm windows, cul-de-sac, 4 yrs old, \$84k. Pete, 334-2963.

Lease: CLC 1 BR condo, FPL, micro, W/D conn, storage, exercise rm, tennis courts, up-stairs new carpet, avail before 1 May. Jim Briley, x44632 or 488-7901.

Sale: Friendswood/Sunset Meadows 3-4 BR-2.5-2, landscaped, lg master, Jacuzzi, garden bath, all BR up, formals, HOW warr, \$110.9k. Don, x35560 or 992-3928.

Lease or Sale: CLC/Baywind II condo, 2-2-2, redc, clean, outside unit, W/D, tennis, sec, \$595 assum. 280-8796 or beeper 938-0921.

Sale: Pearland/Sunset Meadows 3-2-5-2, formals, study, lg master BR, 2 story brick, 2 yrs old, \$110k. Jim, 482-8800.

Sale: 2 Lake Livingston lots, \$5k. James, x36666 or 487-5730.

Rent: Friendswood room w/bath, util paid, \$225/mo. x47049 or 480-3424.

Rent: Galveston condo, furn, sleeps 6, Seawall Blvd & 61st, swimming pools, cable TV, wknd/wk/dly rates. Magdi Yassa, 333-4760 or 486-0788.

Rent: Southern Colorado, 2 BR, furn, sleeps 5, close to skiing, fishing, national forest area, no smoking, no pets, day/wk/mo or longer. Bob, x30825 or 998-7372.

Lease: University Trace condo, 1 BR, study, W/D, ceiling fans, new carpet, all elec, avail immed, \$460. 488-2946.

Sale: Timber Cove waterfront on the canal 3-2.5-2, study, 2400 sq ft, open floor plan, ceramic tile floors, lg cov deck, \$165k. 326-1278.

Cars & Trucks

'71 Chevy Nova, V8, orig owner, \$4.5k. 480-1998.

'87 Dodge Ramcharger, 82k mi, \$3.2k. 487-1883.

'85 Honda Accord LX, white 4 dr, blue interior, A/C, cruise, pwr, 5 spd, low mi, \$2.5k. Brad, x30453.

'91 Jeep Renegade, loaded, 7 yr warr, 13k mi, \$14.7k OBO. x41119 or 532-1026.

'90 Lincoln TC, Signature Series, all options, low mi, \$16.9k OBO. x41119 or 532-1026.

'84 Ford Ranger XLT PU, \$1650. Terry, 747-4180 or 487-5538.

'91 Camaro RS, wht, stereo cass, A/C, \$8k OBO. 282-4216 or 487-2383.

'92 Toyota Celica GT, auto, A/C, pwr, leather seats, alarm, 6 yr warr, 11k mi, \$17.5k. Singh, 333-3313 or 486-0516.

'91 Ford Taurus GL 4 dr, 3.8L, v6, auto, pwr, A/C, AM/FM, 19k mi, bal of 3/50k warr, \$9995. Musgrove, x38356 or 488-3966.

Boats & Planes

'22 Chrysler sailboat *Sacrifice*, 5HP Nissen OB, sleeps 6+, sanded, read for water, 3 sails, \$2k OBO. (409) 245-5290.

O'Brien windsurfer, like new, incl board, 2 piece mast, clamp on boom, reg sail and lg sail, \$285. Leigh, 246-3193.

Cycles

'88 Hurricane, 19k mi, \$2700 OBO. x34204 or 480-2954.

Lady's 10 spd bicycle, ex cond, \$60. Mark, x38013 or 992-4132.

Raleigh Tourister bicycle, made in England, ex cond, 300 mi. \$125. 486-5882 or 538-1579.

'88 Honda Hawk, 650cc motorcycle, 18k mi, good cond, \$1500. 488-4493.

Motorcycles for sale, Suzuki 1000s, Kawasaki, etc, all reconditioned. Jerry, 944-1337.

His and hers 18 spd mountain bikes, ex cond, \$200 for pair. 282-4101.

Audiovisual & Computers

Computer flight program, AzureSoft Elite Personal Flight Simulator, sims Cessna 172 type or Mooney/C-210 type airplane, plus navigation software. 482-9084.

Cooustic 2x25 pwr amp, \$25; Cooustic 4x25 pwr amp, \$65; Clarion 9 band EO front to rear fade and sub output, \$60; Fosgate series I 8 in sub 4 ohm, \$30; prefab ported box for single 8, \$10; ported box for 2 6x9s, \$15; new ported box for 2 10s, \$40; pair Pioneer 6x9s, new, \$15. Brian, 996-8567.

MS-DOS 6.0 upgrade, \$38; Quicken for Windows 2.0, \$35. Martin, x45338 or 488-0949.

Pets & Livestock

One 10 wk old lg fem kitten, blk w/white paws and breast, Russian blue and Siamese parents, \$15. Lynn, x35974.

Silver tabbie pedigree Bengal cats and kittens, m and f, 9 wks to 1 yr, \$200. Walt, x30117.

JSC

Dates & Data

Today

Cafeteria menu — Special: wieners with baked beans. Entrees: beef chop suey, breaded cutlet with cream gravy, grilled ham steak. Soup: beef and barley. Vegetables: buttered rice, Brussels sprouts, whipped potatoes.

Tuesday

Cafeteria menu — Special: pepper steak. Entrees: fried shrimp, pork chop with applesauce, turkey a la king. Soup: celery. Vegetables: au gratin potatoes, breaded squash, buttered spinach.

Wednesday

Change forum — "NASA's Mission" will be the subject of a no-holds-barred, free-for-all discussion about specific proposals for radical change at NASA from 11:30 a.m.-12:30 p.m. May 26 in the Bldg. 3 cafeteria. For more information about the series, call Mike Roberts at x36632.

AFCEA meeting — Dr. F. Ron Bailey, director of aerophysics at the Ames Research Center, will be the featured speaker at the Armed Forces Communications and Electronics Association Houston Space Chapter meeting May 26. Bailey will discuss the "High Performance Computing and Communications Program." The meeting will be held at the Lakewood Yacht Club from 11:30 a.m. to 1 p.m.

Astronomy seminar — The JSC Astronomy Seminar will meet at noon May 26 in Bldg. 31, Rm. 129. Al Jackson will discuss "Rockets and Explosions at Black Rock Desert, Nevada." For more information, call Al Jackson at 333-7679.

Freedom Fighters meet — The Space Station *Freedom Fighters* will meet at noon and 5 p.m. May 26 in Rm. 160 of the McDonnell Douglas Tower, Space Center Blvd. and Bay Area Blvd. For more information, call David Cochran at 482-7005.

Toastmasters meet — The Spaceland Toastmasters Club will meet May 26 at 7 a.m. at the House of Prayer Lutheran Church on the corner of Bay Area Blvd. and Reseda Drive. Call Jim Morrison at 480-9793 for more information.

Cafeteria menu — Special: Mexican dinner. Entrees: fried catfish with hush puppies, braised beef ribs. Soup: seafood gumbo. Vegetables: Spanish rice, ranch beans, buttered peas.

Thursday

Cafeteria menu — Special: hamburger steak with onion gravy. Entrees: corned beef with cabbage and new potatoes, chicken and dumplings, tamales with chili. Soup: split pea. Vegetables: navy beans, buttered cabbage, green beans.

Friday

Cafeteria menu — Special: barbecue link. Entrees: deviled crabs, broiled codfish, liver and onions. Soup: seafood gumbo. Vegetables: buttered corn, green beans, new potatoes.

Monday

JSC offices will be closed for the Memorial Day holiday.

June 2

Astronomy seminar — The JSC Astronomy Seminar will conduct an open discussion meeting at noon

June 2 in Bldg. 31, Rm. 129. For more information, call Al Jackson at 333-7679.

June 8

TSP briefing — A briefing on the Thrift Savings Plan is scheduled for 9:30 a.m. June 8 in Bldg. 45, Rm. 128. Open season for TSP runs from May 15-June 31. For more information, call the Employee Services Section at x32681.

June 9

Toastmasters meet — The Spaceland Toastmasters Club will meet June 9 at 7 a.m. at the House of Prayer Lutheran Church on the corner of Bay Area Blvd. and Reseda Drive. Call Jim Morrison at 480-9793 for more information.

Astronomy seminar — The JSC Astronomy Seminar will meet at noon June 9 in Bldg. 31, Rm. 129. A field trip to inspect the Liquid Metal Mirror Telescope II is planned. For more information, call Al Jackson at 333-7679.

Freedom Fighters meet — The Space Station *Freedom Fighters* will meet at noon and 5 p.m. June 9 in Rm. 160 of the McDonnell Douglas Tower, Space Center Blvd. and Bay Area Blvd. For more information, call David Cochran at 482-7005.

June 14

Space Society meets — The Clear Lake Area Chapter of the National Space Society will meet June 14 at 7 p.m. at the Freeman Memorial Library. Rich Kolker will discuss "Single Stage to Orbit Vehicles." The meeting is free and open to the public. For more information, contact Marianne Dyson at 486-4747.

Musical Instruments

Trombone, ex cond, case; electronic metronome, BO. (409) 938-4793.

Epiphone Emperor TH thin hollow body electric jazz guitar w/hard case, was \$1800, now \$995. 280-9621.

Peavey "Classic" model guitar amp, 2 12 in speakers, reverb, tremolo, chorus. \$395. 280-9621.

Ensoniq SDP-1 elec piano, \$500; Peavey KB-60 combo amp for kybd, \$100; Peavy PV unidirectional microphone w/prof mic stand and cord, \$75. x37359.

Household

Apartment sz stacked washer/dryer, ex cond, \$350. 480-7277.

Four piece BR set, triple dresser, mirror, chest, night stand, \$200. x38893.

Qn sz waterbed, 6 drwrs, bookcase head board, heater, side rails, ex cond, \$150. Tom, 488-3414 ext 5570.

Glass dining table and 4 chairs, table 4 ft by 3 ft, 1/2 in thick. \$175. Brent, x36456.

Refrig/freezer, 20 cu ft Wards side by side w/icemaker, \$300 OBO, can deliver. Rick, x47003 or 480-7196.

Kg sz waterbed, semi motionless, blk leather headboard, \$400. x36696 or 332-9102.

Solid wood dining room table, 5 ft long w/2 1.5 ft extensions, China hutch, 6 x 3.5 x 1 ft, closed in shelves on bottom, glass doors on top w/lighted display area. Dortha, x36584 or 992-4869.

Brown/gold color couch, \$125; 2 gold side chairs, \$100. 282-2588.

Twin sz "Balloons & Confetti" comforter and sheet set, fitted & flat sheets, primary colors w/white background, \$25. x35188.

5 pc sectional w/rocker/recliner, green w/mauve & gray pin stripping, ex cond, 1.5 yrs old, \$850; 6 cu ft GE refrigerator w/blk face, 1.5 yrs old, \$950. 244-1119 or 534-4958.

Largest Kenmore elec dryer, under warranty, \$200. Carlton, x34790.

Brwn sofa, \$100. Craig, x39570 or 480-4961.

Pair walnut chairs, cane sides, cushioned seat & back, \$600 pr; lg gold framed mirror, \$100; lg Peruvian rug or wall hanging, hand made w/figures woven in, never used, \$75. 488-5564.

Barometer w/humidity & temp gages, \$10; sm one drwr file w/metal cover, \$12; lg gas can, GI type, \$7.50; Mixmaster mixer, \$22; Shop Vac, \$17.50. 488-5564.

Carpet, cinnamon-rust, 150 yds, good cond, \$375 all or \$4/yd parts. Mark, x38013 or 992-4132.

Country decor loveseat and chair, quilted, \$75;; 36 in rt handed wooden screen door, \$10; blk louvered frame w/tinted glass for Ford PU, \$30. x35376 or 943-3842.

Oreck XL 9300 G commercial vacuum cleaner, high spd upright, ex cond, 3 more yrs on warr, \$200 OBO. Bob or Annis, 488-7036.

Kohler 4 person hot tub, new Gould pump and 2 spd motor, new frame and insulation, \$1k. David, 929-7120 or 388-2992.

JVC 31 in TV monitor, AV3150S, ex cond, \$800. Gary H., x32144.

Wanted

Want 350 eng, running and reasonable, '82 or later. x48153.

Want mature adult w/school aged child to share 2 rooms in my LC home, quick access to I-45, back yard fenced, \$450/mo + 1/2 util. Tracy, 283-1050.

Want nail technician table in good cond. Deb, x47117.

Want portable gas generator, 3.5-4 kW. Andy, 332-9105.

Want vacuum pump for A/C or refrigeration, working or nonworking; want used white-water kayak, any cond; want used 1/2 in plywood, any grade or finish. Ronnie, x32539 or 538-1649.

Want used infant/child car seats, Claudia, 332-8514.

Want bike child seat and child helmet. Kurt, x47705.

Want return of 3 rogue folding chairs that walked away from JSC picnic on May 1. Blue stripped canvas seat, wooden arms, chrome frame w/spring suspension. L. Grissom, x39525 or 482-0969.

Want roommate to share 2-3-2, 2600 sq ft TH in Bal Harbour behind the Hilton, no pets, \$350/mo + 1/2 util, shiftworker, prefer female. x33654 or 335-0112.

Professional male seeks professional, non-smoker to share luxurious home 5 min from NASA, furnished, qn sz bed, garage, pool, \$425 + 1/2 util and dep. 486-4156.

Want any of the Babysitter series of paperback books, The Babysitter Club, etc.; want Franklin Mint books, preferably leather bound. 280-8746.

Miscellaneous

DP Air Strider dual action walker, stepper, jogger, 1 yr old, \$170. x33980 or 480-2873.

Tecumesh push mower w/side dischg bag, \$100; lg O'Sullivan desk w/hutch and printer stand, \$125; 6'2" Hurricane tri-fin surfboard, \$175; Bell M-1 motorcycle helmet, \$150; Bell Tourstar helmet, \$50; Graco gym walker, \$25; Playskool 40" octagon playpen, \$50; Graco battery operated swing, \$45. 339-1394.

One-way plane ticket from Houston Hobby to Minneapolis to be used between 6-1 and 6-23. x38855 or 480-9724.

Beautiful traditional African clothing imported from Nigeria, ex quality and price. x45130 or 484-6859.

Goldberg Gas Bird 1938, plus all parts and plans for radio control, built for free flight, never covered, all built but wing, \$40. 534-3021.

Inductive timing light, \$25; tach/dwell meter, \$12; cyl compression tester, \$15. 333-3071.

Medical type lounge chair, used for dialysis treatment. E. Rubenstein, x34807 or 532-2211.

Ivory wedding gown w/pearls, sequins, V-neck, chapel length train, sz 6-8, veil and petticoat, \$400. x36696 or 332-9102.

Stainless steel DE swimming pool filter, \$100. (409) 765-7665.

'77 Starcraft pop-up camper, stove, heater, ice box, 5 gal water storage, stand up closet, sleeps 7, opens to 21', hyd brakes, new cables, inside lights work with 12V or 110V. Bobby, x38823 or 339-2198.

Signed limited ed print "In Search of the Beyond" by Pilar Cortella de Rubin, print \$357, framed \$1000. 286-7311.

Little Tykes Junior Gymnastics w/slide, ex cond, was \$69.99, now \$45. Beth, 480-0014.

Soloflex w/leg lift attach, 1 yr old, \$950. Phil, x48255.

Sliding glass door, 80" x 72", \$30; two 5' solid glass windows, \$10 ea. Charlie, x34754 or 554-7116.

Two President & First Lady Charter Gold memberships, \$600 ea. Sandy, x49875 or 480-0125.

Lawn items, bicycle, clothes, books, albums. x39047.

Graco baby walker, \$20; Graco swing, \$10; babywipe warmer, \$10; 2 infant car seats, \$10 ea; baby food processor, \$15; stuffed animal mobile, \$10; giragge growth chart, \$5; new baby photo album, \$5. 484-0970.

Microwave, washer, dryer, sofa, dinette set, pwr wheels 4x4, dresser, waterbed, 2 each of all. Eddy, x35710 or 286-2958.

Taurus PT-92AF 9 mm pistol, ex cond, ambidextrous safety, competition trigger job, Pachmayr and orig walnut grips, six magazines, holster, over 500 rounds ammo, \$475 for all. x36956 or 332-1570.

Encyclopedia Americana 1993, new, unopened, \$600 OBO; Silver Bach Stradivarius trumpet, ex cond, \$500 OBO; Krummar Performer synthesizer, \$200 OBO. Elaine, x30118 or 334-1067.

Men's golf clubs, 1,3, and 5 woods, ex cond, \$100; women's golf clubs starter set w/bag and pull cart, \$45. Chuck, x36176.

Cad



Through the eyes of a girl



Program allows daughters to see adults at work

Daughters saw the workplace through the eyes of their parents, and parents saw the future through the eyes of their daughters during a special program recently sponsored by JSC's Federal Women's Program.

For "Take Our Daughters to Work" Day, the girls were taken into the inner workings of the space program to observe their parent or sponsor on the job.

"This was a learning experience not only for the girls but also for the parents and sponsors because they recognized the girls really were interested in space and the math and science areas," said Pam Adams, FWP program manager. "That's something I don't think everyone expected to come away with."

She added that the JSC event was a pathfinder for similar activities around the country.

"We are proud that we could be a leader in a program that has such potential to positively impact these girls' futures," she said.

Activities also included a tour of JSC facilities and presentations by women engineers and scientists. Presenters were Dr. Deborah Harm and Jeanne Crews, both of the Space and Life Sciences Directorate; Astronaut Kathy Thornton; Dr. Elizabeth Bains and Susan Cupples, both of the Engineering Directorate; and Bebe Ly of the Information Systems Directorate.

Scenes from the day were:

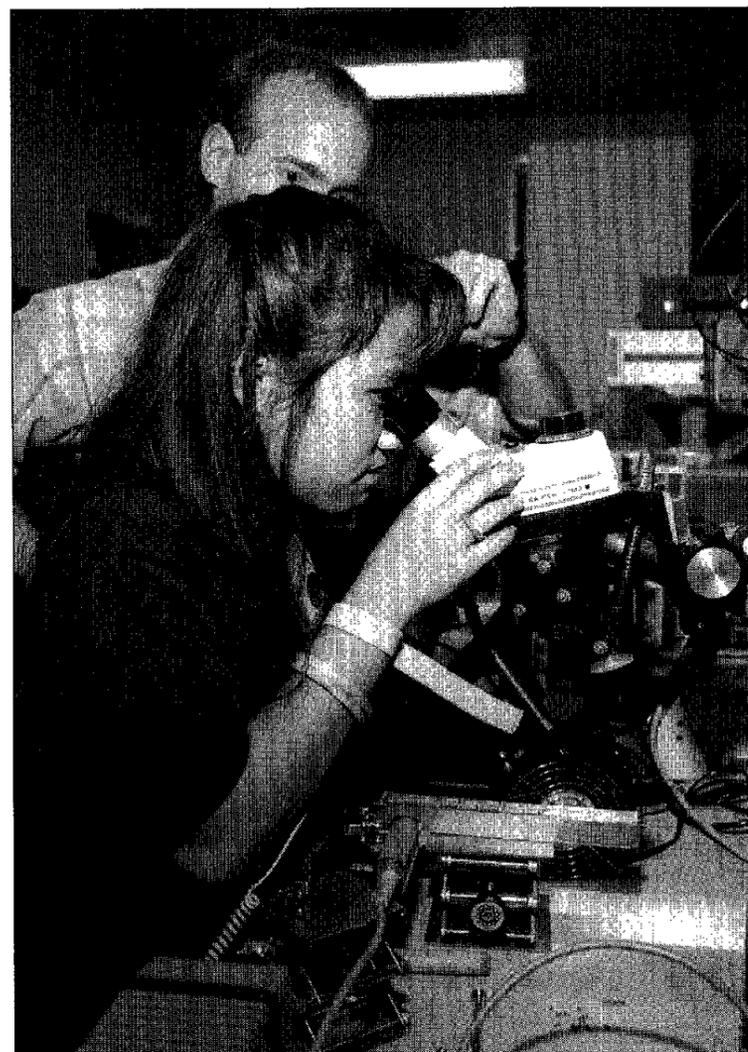
(Top left) Cassandra Williams of the New Initiatives Office's Resource Management Division helps her daughter Candace, 11, get some computer experience by updating a telephone list.

(Top right) Several girls had the opportunity to test the next generation of computer technology with the virtual reality equipment in the Software Technology Laboratory.

(Center) Total of 47 girls and adults participated in the event including 10 students from Richey Elementary that were sponsored by JSC employees other than their parents.

(Bottom Left) Phuong Pham, a fourth grader at Richey Elementary, took a close look at tiny transistors Pat Fink in the Microwave Integrated Circuit Lab.

(Bottom right) During the event, Pham made friends across the center including this fellow in the Space Materials Research Laboratory. Her sponsor (not pictured) was Katie Nguyen of the Facility Development Division.



Photos by Scott Wickes



Four students from Zia Middle School, Las Cruces, N.M., won the contest to name the TDRSS ground stations. The winning team members are (from left to right) Rebecca Polanco, Claudia Dominguez, Summer Parra and Sarah Conner.

Space communication stations get Native American names

NASA's two Tracking and Data Relay Satellite System's ground stations at White Sands, N.M., will now have Native American names as a result of a "Name the Ground Terminals" contest held for New Mexico students.

The names selected were Cacique (kah-see-keh) or "leader" and Danzante (dahn-zahn-teh) or "dancer." The names refer to the Tortugas Indians of Tortugas, N.M., who preserved their culture through traditional dance and were submitted by four students from Zia Middle School, Las Cruces, N.M.

"To those familiar with the culture of the Southwest, these names will give meaning to the purpose of the stations. To those who understand the role of the stations, the names will convey appreciation for the culture of the area" said NASA Associate Administrator for Space Communications Charles Force.

Entries had to relate to Native American, Hispanic or African

American local culture; be appropriate for space communications and America's involvement in space; limited to one to two words in length; and show relationship between the two names.

"The students compared the TDRSS to the Tortugas dancers. The dancers communicate through complex maneuvers as do the TDRSS satellites. The ground terminals are the leaders of this orbital dance," said Wilson Lundy, manager of the Space Network Complex at White Sands.

The contest was sponsored by NASA, the New Mexico Space Grant Consortium and New Mexico State University. Students from elementary, middle and high schools, in qualifying school districts, were eligible to participate. More than 100 entries were received.

Each team consisted of four students and a team coordinator. The coordinator was responsible for guiding the team's activities and sub-

mitting the entry. Each team could submit only two names, one for each station. Each team had to be from the same school and only one entry could be received from a team. There could, however, be more than one team and one entry from each school.

Winner, runner-up and honorable mention teams were selected by a panel of judges. The winning students will receive a two-day trip to JSC. Each member of the runner-up team will receive a Franklin Language Master, which functions as a thesaurus, dictionary and spelling corrector. Members of the honorable mention team will receive an official TDRSS Ground Terminal Naming Contest T-shirt. Each team member will receive a certificate for his or her participation.

The ground terminals are responsible for receiving and transmitting telemetry, voice, video and data acquisition for Space Shuttles and Earth-orbiting satellites.

Team recognized for spacewalk overhead reduction efforts

By Audrey Schwartz

Space station astronauts will spend more time on extravehicular housekeeping tasks and less time getting ready for them thanks to the recommendations of a JSC improvement team.

The EVA Overhead Reduction Team received the JSC Group Achievement Award for their EVA system hardware change package Friday. The team consists of JSC employees from Missions Opera-

tions, Engineering, Space and Life Sciences, Flight Crew Operations, and Safety, Reliability and Quality Assurance as well as from the contractor team of McDonnell Douglas, Lockheed, Rockwell and Loral.

"All external station systems such as avionics boxes and other hardware must be maintained by either EVA crews or robots, and a great majority of what needs doing is by a crew member in a suit not a robot," said Barry Boswell, Work Package 2

maintenance manager and team leader. "Based on ground tests and shuttle flight experience we realized that a productive EVA crew member must be fairly unencumbered by the things we ask to move from point to point."

Every minute counts during an EVA. During an average six hour station maintenance EVA, the less time needed to move tools, hardware and equipment, the more time available to spend on needed tasks.

Recent flight experience and ground testing raised questions about mass and size handling capabilities of a suited astronaut and about the need for additional crew members or equipment to complete specific tasks that would greatly decrease EVA productivity.

The EVA Overhead Reduction Team was formed to analyze test data and make recommendations to reduce "housekeeping" chores necessary for station upkeep.

The team recommended changes to existing hardware or for new supporting equipment. Changes include those to the station baseline vehicle such as a decrease in the distance between EVA system handrails. New equipment was advocated including the use of a rigidizing tether. The team also suggested ways to be more productive in equipment use, either by relocating items for crew convenience or making tools work smarter.

Patent holders honored

More than 30 JSC engineers and scientists recently were honored for their patents and technical papers at a special awards ceremony with Director Aaron Cohen.

Five individuals received awards for NASA Tech Briefs. They were Leo G. Monford Jr., An Automation of the Targeting and Reflective Alignment Concept Sensor; Kriss J. Kennedy, Horizontal Cylindrical Inflatable Habitat; Kent D. Castle, In Vivo Cavitation System; George B. Roush, COSTMODI; and Lui Wang, Fuzzy Medial Axis Transformation Based Processing System.

A group of 10 received a Patent Application Award for the Pre-Integrated Truss Space Station and Method of Assembly. Group members were James B. McDede, John V. Rivers, Donald C. Wade, Edgar O. Castro, Gregg A. Edeen, Kornel Nagy, Timothy E. Pelischek, Irene E. Verinder, David A. Hamilton and Clarence J. Wesselski.

Other Patent Application Awards went to Fredric S. Dawn, Protective Helmet Assembly; William B. Wood, Quick Acting Gimbal Joint; Duane L. Pierson, Kinetic Tetrazolium Micro-titer Assay; Donald L. Henninger, Douglas W. Ming and D.C. Golden,

Active Synthetic Soil; Douglas Ming and D.C. Golden, Slow-Release Fertilizer; Karen L. Nyberg, Robot Friendly Probe and Socket Assembly; Richard D. Juday, Full Complex Modulation Using Two One-Parameter Spatial Light Modulators; Darin N. McKinnis, Fastening Apparatus Having Shape Memory Allow Actuator; Leslie S. Hartz, Extravehicular Activity Translation Tool; Steven L. Koontz, Microporous Structure with Layered Interstitial Surface Treatment, and Method and Apparatus for Preparation Thereof; Andrew J. Petro, Space Station Trash Removal System; Michelle A. Rucker, Ablative Shielding for Hypervelocity Projectiles; and Glenn F. Spaulding, High Density Cell Culture System.

Board Awards went to William C. Hoffman III and Robert L. Robinson, Four-Terminal Electrical Testing Device; Lui Wang, Dynamic Pattern Matcher Using Incomplete Data; Marvin L. LeBlanc, Erik Geisler, Gary Smith and Scott McClanahan, Distributed Earth Model and Orbiter Simulation System Virtual Reality in Real-Time MCC Operations; and Richard L. Sauer, Regenerable Biocide Delivery Unit.

Employees honored for service

Several JSC employees received 1993 Public Service Awards from the Houston Area Federal Executive Board and Federal Business Association at an awards luncheon earlier this month.

William Kelly, JSC's director of administration, was named Federal Executive of the Year and Pamela Adams, manager of the JSC Federal Women's Program, received the Outstanding FWP Manager Award

from the FEB. The Supervisory Award went to Donna Blackshear-Reynolds of Exploration Program Development and Control Office and the Professional Award was presented to Gloria Araiza of the Mission Operations Directorate.

Kathleen Hosea of Flight Crew Operations received the Technician Award and Raymond Smith of Mission Operations received the Length of Service Award.

Council seeks award nominations

The Clear Lake Council of Technical Societies is accepting nominations for the Technical Person, Technical Administrator and Technical Educator of the Year.

Nominations for the honors are sought from CLCTS member organizations. Candidates must show excellence in his or her area of technical endeavor and have made exceptional

contributions in the technical area relevant to council members. Candidates must be nominated by a member society of the council, but need not be a member of any technical society. Deadline for the nominations is Friday, and winners will be honored at the annual awards banquet June 18. For more information contact Patrick Brown at 333-0926.

Magellan to test aerobrake technique in Venus orbit

NASA's Magellan spacecraft will dip into the atmosphere of Venus beginning this week in a first-of-its-kind "aerobraking" maneuver to lower the spacecraft's orbit and start a new experiment.

The aerobraking technique will use the drag created by Venus' atmosphere to slow the spacecraft and circularize Magellan's orbit. Currently Magellan is looping around Venus in a highly elliptical orbit.

"This aerobraking technique has never been used before on a NASA planetary mission," said Douglas Griffith, Magellan project manager at the Jet Propulsion Laboratory.

"Magellan has been highly successful in completing all of its primary mission goals," said Alphonso V. Diaz, deputy associate administrator for NASA's Office of Space Science. "The new orbit will enhance the scientific return from what is already one of NASA's most successful space science missions."

According to Griffith, aerobraking is the only way to make such a large change in Magellan's orbit because the spacecraft does not have enough thruster fuel onboard

for the change.

"Although aerobraking creates some risk of losing the spacecraft, the scientific benefits make the risk worthwhile," he said.

The benefit of changing the orbit is to make possible better measurements of Venus's gravity field, particularly at latitudes near the planet's poles, said Dr. R. Stephen Saunders, Magellan project scientist.

For the past eight months, Magellan has been collecting data on Venus' gravity. However, measurements from the current elliptical orbit are blurred at high latitudes by the height of the spacecraft above the surface — about 1,300 miles (2,100 kilometers) near the north pole and 1,700 miles (2,800 kilometers) near the south pole.

Scientists also hope to study Venus's atmosphere using data collected during the aerobraking experiment itself. And another objective is to gain the engineering experience that may allow future missions to use aerobraking to enter planetary orbit or to change orbit without using large thrusters.

Launched in May 1989, Magellan will complete its fourth 243-day orbital cycle at Venus on May 25. During each of the 8-month cycles, Magellan

orbits from north to south while the planet turns once underneath the spacecraft.

During earlier cycles, Magellan used its radar to map Venus's surface with a resolution as fine as 250 feet (75 meters). Data was obtained on the elevation, slope, radar reflectivity and radar emissivity over 98 percent of the planet.

In the upcoming maneuver, flight controllers hope to lower the spacecraft's orbit from its current low point of about 100 miles (170 kilometers) and high point of 5,300 miles (8,500 kilometers) to a target orbit of 125 by 375 miles (200 by 600 kilometers). This would alter orbit time from 3-1/4 hours to about 90 minutes.

The aerobraking experiment will start at 12:30 p.m. Central Tuesday when the spacecraft makes the first maneuver. By controlling the orbit altitude, the drag and heat generated on the spacecraft will be kept within tolerable limits.

Completing the change will take about 80 days. The short period of drag on each orbit, a few minutes at the start to about 20 minutes near the end, will lower the orbital high point by about 6 miles (10 kilometers) on every orbit.

STS-55 studies life, materials science in space

(Continued from Page 1)

monitor and study the samples as they melted and resolidified.

Ross said that being able to watch the process, judge the sample, and alter the process real-time contributed to the successful results. The samples are being returned to scientists in Germany for further study of their physical properties.

The flight may be over, but crew members said German scientists have years of data to evaluate.

Space News Roundup

The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every Friday by the Public Affairs Office for all space center employees.

Dates and Data submissions are due Wednesdays, eight working days before the desired date of publication.

Editor Kelly Humphries
Associate Editor Kari Fluegel

STS-57 crew looking forward to variety on orbit

(Continued from Page 1)

EVA techniques and procedures. The spacewalk, which will occur on the fifth flight day, is part of the detailed supplementary objective designed to gain experience for future EVAs.

Wisoff, one of the crew's three space rookies, said the diverse nature of the flight is more than a first time flyer to hope to experience.

"It gives us a chance on a first flight — for Nancy, Janice and I — to get a flavor for everything," he said.